certain conditions -- conditions that are remarkably vague in their application and that may not hold true once the numerous CLECs that have expressed interest in combining UNEs begin to request space. Finally, there is reason to doubt BellSouth's ability to meet these intervals: BellSouth has only limited actual experience in providing collocation and virtually no experience providing collocation that will be used to combine UNEs. To date, that experience shows that BellSouth has in fact been unable to provide collocated space in a timely manner, undercutting the reliability of BellSouth's inadequate paper commitments.

76. As to BellSouth's paper commitments for the inquiry phase of virtual and physical collocation, BellSouth claims that it will "respon[d] to individual Virtual Collocation Application Inquiries within 20 business days from receipt . . . and individual Physical Collocation Application Inquiries within 30 business days from receipt." Tipton Aff. ¶ 21 (emphasis added). Two points can be made about these intervals. First, because the intervals are measured in business days, the actual calendar response time will be nearly 30 calendar days for virtual collocation applications and over 40 calendar days for physical collocation applications. Typically, the "[r]equesting collocators will have 30 calendar days to review BellSouth's written response . . . and submit a complete and accurate Firm Order." Tipton Aff. ¶ 24 (emphasis added). Accordingly, if everything follows the plan, the entire inquiry phase for each single request will take nearly two months for virtual collocation and about ten weeks for physical collocation.

77. Second, as BellSouth's Master Collocation Agreement makes clear, the response intervals apply only to a maximum of "three applications for space within the same

state submitted within a fifteen business day interval. . . . .When [a CLEC] submits more than three applications in the same state within 15 business days and BellSouth is processing multiple applications from other Interconnectors, BellSouth and [the CLEC] will negotiate in good faith a prioritization of the requests and a reasonable response time frame." Master Collocation Agreement, § 4.1.1, Tipton Aff., PAT Exh. 1 (emphasis added). With approximately 20 business days per month, a CLEC could expect that BellSouth could process a maximum of 12 applications every three months while still maintaining the promised response intervals. In Louisiana, there are more than 200 locations (including central offices and remote switching locations) at which collocated space would be needed in order to compete for all of BellSouth's customers. Thus, if on August 1, 1998, AT&T began submitting in Louisiana three applications every 15 business days, BellSouth would complete the final set of responses some 50 months later, in about October, 2002. As this figure shows, even BellSouth's paper commitments for the response times for physical and virtual collocation place significant delays on CLEC market entry via combined UNEs.

78. Turning to BellSouth's paper commitments for the construction and installation phase, these promised intervals likewise provide for significant delay. First, I note that BellSouth provides no intervals for the second phase of virtual collocation, i.e., the time period for BellSouth to take control of the CLECs' equipment, to install it, to complete all the pre-wiring, and to begin the first cut-overs. Presumably, since a separate cage need not be constructed in the central office, a CLEC might expect the interval for virtual collocation to be shorter than for physical. However, BellSouth does not provide any data

for how quickly it can virtually collocate equipment, nor does it provide even a paper commitment for this interval.

79. For intervals for physical collocation, BellSouth states that "BellSouth will complete Physical Collocation space, under ordinary conditions, within 120 days of receiving a complete and accurate Bona Fide Firm Order." Tipton Aff. ¶ 27 (emphasis added); Master Collocation Agreement, § 4.3. However, several conditions apply to this interval. First, it "[e]xclud[es] the time interval required to secure the appropriate government licenses and permits." Id. Second, the intervals do not apply "where [intervals are] otherwise specified by negotiated contract terms or state commission decision." Id. Finally, and most importantly, when so-called "extraordinary conditions" occur, BellSouth will not commit to complete construction of collocation space until "within 180 days" of the CLECs' order date (I assume that the "120 days" and "180 days" specified by BellSouth in these instances means calendar days). BellSouth's definitions of extraordinary conditions triggering the longer six month interval are remarkably vague, and BellSouth provides no information on how frequently such conditions might occur in its region or in Louisiana specifically.[21] Accordingly, the 120 day provisioning period for physical collocation is clearly

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[21] In addition, one of the triggering extraordinary conditions is "multiple requests in excess of four (4) from one customer." Id. It is quite possible that some CLECs will have at least four physical collocation requests pending at times in the near future. Even though those CLECs could reduce costs by applying for virtual collocation, a CLEC may make multiple requests for physical collocation, for example, with the expectation that it will install its own switches or other equipment in the future. Thus, at least at the outset of entry, this "extraordinary" condition may be common.

a best-case scenario that does not apply under several foreseeable, and perhaps common, conditions.

80. Next, although BellSouth sometimes refers to the 120 or 180 day interval as the "provisioning period," that period does not represent the entire time needed before a CLEC can begin operations using collocated space. Rather, BellSouth's commitment intervals appear only to include the construction of the collocated space, and not the installation of equipment in the space. For installation, CLECs are required to use a BellSouth-approved vendor, and BellSouth "will not accept requests to connect service to the collocation arrangement" until the CLEC and the vendor notify BellSouth that the equipment is installed, tested, and ready to provide service. Tipton Aff. ¶¶ 29, 33. Accordingly, the CLEC's ability to provide actual competitive service using combined UNEs depends upon how quickly a BellSouth-approved vendor can install and test the equipment. Although BellSouth has approved several vendors, BellSouth provides no commitments for installation intervals by its vendors. Although I expect that installation time for a pre-wired frame and its associated connectivity would take only a relatively short period of time, the uncertainty and lack of commitment from BellSouth makes it difficult to determine how long it will take for installation and testing of the equipment in the collocated space.

81. However, even under BellSouth's best-case scenario, in which its intervals in fact apply, the total time for the construction and installation phase of physical collocation would range from approximately 125 to 200 days, or 4 to 6 months. Added to the 10 weeks expected for the inquiry phase of physical collocation, the entire physical

collocation process for any one central office, from the date of the request until service can actually be provided, will last from six to eight months.

82. Of course, this scenario represents only BellSouth's paper commitments for physical collocation intervals. When it rejected BellSouth's collocation offer in South Carolina, the Commission recognized that estimates for collocation intervals should be reinforced by data showing the actual practices. See BellSouth South Carolina Order ¶ 203 ("Our concern with BellSouth's failure to commit in the SGAT to provisioning collocation within a definite interval is heightened by BellSouth's failure to demonstrate that it is in fact offering collocation in a timely manner."). The BellSouth intervals are likely more optimistic than what could be expected to occur in practice, under competitive conditions in which numerous CLECs will be seeking collocated space. In fact, BellSouth itself admits that the intervals it promises would not in fact apply if even one CLEC requested construction of space in every central office.[22] In testimony before the South Carolina Public Service Commission, a BellSouth witness conceded that BellSouth did not have the capability to build collocated space in every central office simultaneously, and that such requests "would probably indeed cause a big bogdown." Id.

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[22] Attachment 17, Excerpts of Testimony of D. Redmond (BellSouth), South Carolina Public Service Commission, Proceeding to Review BellSouth's Cost Studies for Network Elements, Docket 97-374-C, Vol. III, Dec. 17, 1997, at 63-64 ("Redmond South Carolina Testimony") (responding affirmatively when asked whether BellSouth's intervals for providing collocated space would "get worse if a CLEC came in and said I need colocation [sic] space in every central office in the state."). And, this testimony applied to South Carolina, which has 100 central offices, one-half of the offices of Louisiana. See id.

83. These delays in providing space are not limited to BellSouth, but apply to other RBOCs, and seemingly are inherent in collocation. For example, Bell Atlantic-New York ("BA-NY") recently testified before the New York Public Service Commission that there are significant limits to the number of collocation requests that it can handle at any one time. Although there are more than 500 central office and remote switch locations in BA-NY's territory, BA-NY claims to be able to handle only 15-20 collocation requests per month statewide, and no more than 8 applications total per month in any one of its five designated geographic regions within the state.[23] That witness also admitted that a request from just one CLEC for collocation in all 522 central offices in New York "will cause an inability to meet the demands" for over "two years" and "will cause chaos." Hearing Transcript, NY PSC Docket No. 97-C-0271, Maguire Testimony, Tr. 303. Accordingly, these paper commitments must be viewed with considerable suspicion.

84. And in Louisiana, BellSouth simply does not have enough experience to provide confidence in its estimated intervals. To date, BellSouth has completed at most only three physical collocation arrangements and six virtual collocation arrangements in Louisiana. Milner Aff. ¶ 27. Indeed, the information provided by BellSouth on these few arrangements is both incomplete and internally inconsistent, making it impossible to draw

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[23] Affidavit of Karen Maguire, Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Condition Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996, NY PSC, Docket No. 97-C-0271, ¶ 20 ("Maguire Aff.") (excerpt attached as Attachment 18).

any firm conclusions regarding BellSouth's ability to provide collocated space in a timely fashion. For example, Mr. Milner's affidavit states that two physical collocation arrangements have been completed, although his attached exhibit appears to show that three have been completed. Compare Milner Aff. ¶ 27 with Exhibit WKM-2. The exhibit also appears to contain basic errors for the dates provided: for the second completed arrangement (line 7 of WKM-2), the space acceptance date of September 5, 1997, precedes the space ready date of February 15, 1998, apparently because the former date is incorrect (it matches the space ready date from another application). The same error occurs in the last completed arrangement (line 8 of WKM-2), where the space acceptance date of December 19, 1997, precedes the space ready date of February 15, 1998. Because of these errors, the total time to establish collocated space, from the initial request date to the completion of installation, simply cannot be determined. Accordingly, BellSouth has not shown that it is providing collocation in Louisiana in a timely manner.

85. Although BellSouth has established more collocation arrangements outside of Louisiana, those installations do not in fact support the BellSouth intervals. First, as the Commission noted in its BellSouth South Carolina Order ¶ 203, the evidence in that record "create[d] a concern that there may be significant delays as new entrants wait for collocation space to be constructed."[24] And, CLECs are continuing to report problems with

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[24] Thus, as the staff of the Florida PSC found in declining to approve BellSouth's petition for interLATA authority, "BellSouth's inability to establish physical collocations in a timely manner is still a problem which has a direct affect on the [CLECs'] ability to compete (continued...)

BellSouth's collocation process. In a recent state proceeding, for example, ITC^DeltaCom stated that "BellSouth has consistently delayed ITC^DeltaCom's efforts to obtain physical collocation" and that of "twelve outstanding applications for physical collocation in Alabama as of March 12," 1998, "only two [have been] completed."[25] ITC^DeltaCom not only complained of "undisclosed" and "hidden charges" assessed by BellSouth, but also that BellSouth's response intervals "fai[l] to show the time from the submission of the application to date of BST's response," which DeltaCom found to be 64 days, rather than the thirty days claimed by BellSouth's witness. Id.

86. Similarly, NEXTLINK reported that when it asked BellSouth "why collocation could not simply be ordered out of the SGAT," BellSouth's personnel responded by asking "'What's an SGAT?'"[26] When informed by NEXTLINK, "BellSouth responded that the SGAT lacked sufficient terms and conditions for collocation." Id. (emphasis added). And in Tennessee, where NEXTLINK had established thirteen physical collocation

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[24] (...continued)
meaningfully in the marketplace." Memorandum of Fla. PSC Staff, Docket No. 960786-TL, Consideration of BellSouth Telecommunications, Inc.'s Entry into InterLATA Services Pursuant to Section 271 of the Federal Telecommunications Act of 1996, p. 70 (Oct. 22, 1997) ("FPSC Staff Mem."), aff'd in relevant part, Florida PSC, Order No. PSC-97-1459-FOF-TL (Nov. 19, 1997).

[25] Post-Hearing Brief of ITC DeltaCom Communications, Inc., In re Petition for Approval of SGAT, Alabama Public Service Commission, Docket 25835, at 26-28 (Apr. 2, 1998) (excerpt included as Attachment 19).

[26] Attachment 3, NEXTLINK Georgia, Inc.'s Comments on BellSouth's Notice of Intent, Georgia Public Service Commission, In the Matter of Consideration of BellSouth's Entry into InterLATA Services, Docket No. 6863-U, at 7 (June 15, 1998).

arrangements with BellSouth, NEXTLINK reported that its "experience in obtaining collocation demonstrates that it is a lengthy and costly process."[27]

87. By requiring collocation as a condition precedent to a CLEC obtaining combination of the loop and switching elements, BellSouth imposes on every CLEC seeking to use these UNEs in combination another layer of negotiation, expense and unpredictable delay. Moreover, those CLECs who are able to navigate the collocation application and installation process will, at the end of the day -- and several months later than necessary -- merely be positioned to begin the provisioning of service to customers.

2. Limits In Cutting Over Customers

88. A second source of market entry delay is the manual work needed to establish the cross-connections on the MDF (and possibly the IDF). As described above, this involves two basic steps that would typically be performed by a team of three technicians: one person working on the line side of the frame, one on the switch side, and a third who coordinates their activity, e.g., by calling out assignments and block appearances on the frame. First, the team would connect the connector block containing the loop appearance to the connector block containing the tie-cable to the CLEC's collocated frame. Second, the team would connect the connector block containing the tie-cable coming from

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[27] Direct and Rebuttal Testimony of Russell Land on Behalf of NEXTLINK, Tennessee, Tennessee Regulatory Authority, In re BellSouth's Entry into Long Distance (InterLATA) Service in Tennessee, Docket No. 97-00309, at 17 (March 27, 1998) (excerpt included as Attachment 20).

the collocated frame to the connector block containing the switch port. See Figure 6 (Attachment 21). This wiring must be done on a customer-by-customer basis.

89. The need for this manual labor at the frame is itself a significant bottleneck that would defeat any attempt to use physical or virtual collocation as a vehicle for mass market entry. First, there is a limit to the number of technicians that can work effectively on an MDF at one time. No more than two or three teams of two-to-three frame technicians can work effectively at one time. Regardless of an MDF's size, because of the nature of the layout of the frame and how cross-connections must be run, putting more bodies on the frame does not increase output. To the contrary, more bodies invariably causes interference and thereby actually slows down the progress that any one team is able to make. My estimate of two frame crews working efficiently is based on my own personal experience working on frames in downtown New York City central offices, which probably have some of the largest frames in any network. Other experienced frame technicians agree with me on this point.[28] As soon as additional technicians are working on the frame, they truly begin to interfere with each others' progress, resulting in an actual decrease in productivity (and an increase in frustration).

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[28] In a recent proceeding before the New York Public Service Commission, both I and two other engineers with extensive experience performing and supervising framework testified that if any more than two crews try to work on a single frame at one time, they will get "stuck in each other's way" and will not work efficiently. See Panel Testimony of R. Falcone (AT&T), Reed (Sprint) and Fogarty (COVAD), Proceeding on Motion of the Commission To Examine Methods by which Competitive Local Exchange Carriers Can Obtain and Combine Unbundled Network Elements, NY PSC, Case No. 98-C-0690, at 398 (Falcone), 425-26 (Fogarty) (June 30, 1998) (Excerpts included as Attachment 22).

90. Second, there is a limit to the number of cutovers that any team can effectively do in a given shift. Care must be taken to be sure that the correct tie-cable and pair numbers and block assignments have been identified, that the wire insulation is properly stripped, that there is no call on the line at the time of the cutover, that the cutover is being coordinated appropriately with the software changes in the switch needed to establish UNE-based service, and that connectivity has been reestablished.

91. Third, mistakes in inventory records concerning the customer's cable and pair and block assignments, or concerning the CLEC's assignments, will further delay, if not require postponing, the cutover. As I discussed above, see supra ¶¶ 41, 51, this is a significant potential problem that BellSouth has not yet addressed. BellSouth's record-keeping system, like that of other ILECs, is designed to keep track of two related sets of numbers: the cable and pair number where the customer's loop terminates, and switch port assigned to that customer. In BellSouth's collocation approach to combining UNE's, BellSouth will now have to keep track of yet two more sets of numbers (the cable and tie pairs on each of the CLECs' blocks), and relate those to BellSouth's existing records. BellSouth's existing databases are not designed to accommodate this additional information, and BellSouth has not claimed that it has developed the necessary new databases to accomplish this task. The need for more complex recordkeeping introduces another opportunity for human error, and hence for service outages and delay.

92. The problems I have just described would significantly limit the number of cutovers that ILECs could perform in a day even if there were no other

constraints on provisioning the work. But there are still other important constraints. Many ILEC central offices are unmanned or are only lightly staffed, with no technicians regularly present. At central offices that do have technicians assigned to them, there frequently is work already taking place on the frame that would further reduce the ILEC's ability to accommodate additional frame work for CLECs. And presumably BellSouth's existing workforce is already fully occupied with frame work that currently needs to be done. It is therefore not at all clear where all of the technicians needed to perform the manual work for CLECs will come from. BellSouth simply has not provided any data, let alone binding assurances, that it has available sufficient teams of qualified technicians who can perform cutovers accurately and in the volumes and short time frames that actual competition will demand.

93. Nothing in BellSouth's application responds seriously to these concerns. Mr. Milner merely assumes away the problem. He states that

> [a]s to limitations on the number of customer orders that could be completed in a given day, the notion of a very constricted quantity of BellSouth technicians working at BellSouth's MDF simultaneously is not a concern. . . . The number of technicians working at the MDF is a function of work to be performed rather than any limitation imposed by the physical size of the MDF.

Milner Aff. ¶ 45. This is a non-answer. As I have just described, the limitations on the number of teams that can work on an MDF flows not from the size of the MDF, but rather from the frame's layout and the nature of the work involved in adding and removing cross-connects.

94. Equally as important, (and even if several teams of technicians could work together efficiently on the MDF), Mr. Milner's statement does not and cannot point to any firm commitment -- or even a firm estimate -- of the number of technicians that BellSouth could have available to perform this work. To the contrary, BellSouth has dodged the issue in other contexts. In response to AT&T's questions concerning "how many teams of technicians" could deploy and how many "jumper connections" BellSouth could complete, per day per central office, BellSouth would only answer that it is "committed to employing appropriate forces to meet the demand of CLECs." See Attachment 13 (BellSouth 2/10 Response, at 3). BellSouth's refusal to respond with concrete, defensible commitments of how it could provision mass volumes of combination orders is telling evidence that it could not do so, and that CLECs' have identified actual and serious concerns that a collocation requirement would gate market entry.

95. BellSouth also attempts to respond to these concerns by claiming that performing cutovers is a "routine practice" and that its experience will enable it to meet CLEC needs. Milner ¶ 24; Br. at 39. But, as I have discussed, BellSouth's experience is of little relevance here. See supra ¶¶ 63-64. A CLEC that attempted to provide meaningful competition to BellSouth -- that pursued state-wide entry, with mass-market advertising, generating a high-volume of new customers -- would generate volatile and unpredictable demands for cutovers at every central office, large and small, manned and unmanned, throughout the state. These are demands that BellSouth's manual process for combining loops and switching could not meet.

96. The only formal estimate of the number of orders that an ILEC could provision per day of which I am aware was proposed by a consultant retained by BA-NY. That consultant has estimated that the maximum number of loop/switch combination orders that a BOC could provision in a single large central office per day is 143.[29] Considering that a typical central office in a large urban area may serve over 200,000 lines, this in itself is an insufficient number to support meaningful UNE-based competition. It is useful to note several reasons why this is an unrealistically high estimate.

97. First, the estimate assumes that three shifts of two-technician teams are available to work around the clock.[30] While that might be possible to achieve for a short period of time at one urban central office, in my experience, BOCs typically do not have idle qualified technicians available for reassignment to such projects for extended periods of time. Indeed, as noted above, at many suburban and virtually all rural central offices, there are no frame technicians on site as a regular matter at any time. At those offices, one shift of 1 to 3 technicians would mark a significant event; three shifts of two-technician teams would rarely, if ever, occur. Thus, it is unreasonable to assume that any ILEC has sufficient

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[29] Affidavit of Gerard Mulcahy, Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Condition Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996, NY PSC Docket No. 97-C-0271, at Att. 1, pp. 16-17 ("Mulcahy Aff.") (excerpts included as Attachment 23).

[30] Mulcahy Aff., Att. 1, p. 16.

resources to staff 2 full teams of experienced frame technicians around the clock, except at best, for brief periods in selected offices.

98. Second, the BA-NY consultant's estimate assumes that no frame work would need to be done for the ILEC's purposes. That, too, is unrealistic. Because a maximum of two teams of people can work efficiently on an MDF at any one time, a realistic estimate would have to take into account the non-CLEC related frame work that may need to be completed as well.

99. Third, in every case where ILEC technicians install new wires on the MDF to accomplish a recombination the loop and switching elements for an existing customer, the technicians will also have to perform a separate job (or jobs) to disconnect and remove (or "mine") the existing wires from the MDF. Thus, each loop-switch recombination will require at least three (and possibly four) job orders for ILEC technicians at the MDF, which could significantly reduce the number of customers who could actually be moved to a loop-switch combination.

100. Fourth, the BA-NY consultant's analysis fails to consider that additional time will be needed to coordinate the two cross-connect jobs BA-NY's technicians will have to perform when a CLEC provides service using an ILEC loop and switch. New M&Ps would plainly be required to handle such coordinated cross-connect orders. Based on my experience, it is reasonable to expect that implementation of these M&Ps will increase the time ILEC technicians need to perform a cutover, especially in the

early stages of work, thus further reducing the number of lines an ILEC could cutover to a CLEC in a day.

101. Fifth, the estimate does not directly translate into a number of new CLEC customers per day because it does not take customer churn into account. Thus, the daily limit on orders, whatever it may be, is a limit not simply for new loop/switch customers, but for the wiring necessary to switch customers between CLECs or from CLECs back to the ILEC. A number of CLECs, including AT&T, WorldCom, LCI, MCI, and Sprint, have expressed interest in serving customers with loop/switch combinations, and other CLECs can be expected to order unbundled loops. Thus, it is plain that the number of new customers that can be added at a large central office per day is a small fraction of the ILECs' estimates.

102. Finally, the estimates do not take into account provisioning delays resulting from human error. It is obvious, however, that the potential for error in provisioning the loop/switch combination through collocation is substantial. Most notably, proper wiring is vitally dependent on the accuracy and consistency of the inventories that the CLECs and ILEC would each need to keep, but would keep separately. In the absence of extensive inter-company coordination to keep and maintain mutually consistent databases of these records, it is inevitable that inconsistencies will emerge that will further delay or cause errors in provisioning.

103. In summary, the limits that this manual work places on the number of CLEC customers that can be provisioned on any given day translates directly into

restrictions on the CLECs' ability to market their services. CLECs would not be able confidently to engage in mass marketing through, for example, radio, television, and print advertisements, for that likely would lead to demand at a given central office far beyond what the ILEC could provision. The Commission has observed, in discussing nondiscriminatory access to an incumbent LEC's operations support systems, that ILECs must be able to handle "the order volumes and fluctuations reasonably expected in a competitive marketplace," particularly during the early stages of competitive entry when "order volumes" will "be relatively volatile." Ameritech Michigan Order ¶ 199. The same is true here. However, manual recombination would so gate entry that CLECs would likely be forced to market only through controlled outbound telemarketing or direct mail, so that marketing could be shut down once capacity limits at individual central offices were met. This is not a recipe for meaningful local competition.

3. Exhaustion of Space at the MDF

104. In addition to the limits on the number of cutovers that ILEC technicians could accomplish for CLECs, there are limits to the number of new terminal blocks that can be accommodated on any given MDF. Each of BellSouth's collocation proposals, whether physical, cageless, or virtual, requires the addition of new terminal blocks on the MDF. This is likely, in at least some central offices, to pose a serious constraint to use of collocation as a vehicle for mass-market entry.

105. The reason for this is that, in many central offices, the MDF is already nearly or entirely occupied by terminal blocks assigned to ILEC customers, and there is

often little additional room in the building to add to the size of the MDF. See also Joel Aff. ¶ 45 (Attachment 1). Yet if CLECs were to take, for example, 20 percent of the ILECs customers using combinations of loops and switching, the MDF would need to grow 20 percent to accommodate that growth.

106. BellSouth does not even attempt to address this problem. Indeed, BellSouth admits that "to add capacity to its Main Distribution Frame . . . is a complicated, time consuming process," Reply Aff. of W. Milner, CC Docket 97-231, ¶ 4 (Dec. 16, 1997), and that assumes that space for expansion exists, which is not always the case. For example, another ILEC, Bell Atlantic New York, recently admitted that some of its central offices could not accommodate even 10 percent growth at the MDF.[31] Bell Atlantic has also resisted alternatives to collocation that nevertheless involve adding terminal blocks to the frame because of the risk that adding such blocks will quickly exhaust capacity on the MDF.[32] As central offices run out of room for new blocks, CLECs will face delays or even outright interruptions in their ability to sign up new customers.

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[31] Testimony of Donald Albert, Bell Atlantic, Proceeding on Motion of the Commission To Examine Methods by which Competitive Local Exchange Carriers Can Obtain and Combine Unbundled Network Elements, NY PSC, Case No. 98-C-0690, Tr. 257 (June 29, 1998) (excerpt included as Attachment 24)

[32] Panel Testimony, by Donald Albert, In the Matter of DPU 96-73/74, 96-75, 96-80/81, 96/83, 96-94, BellAtlantic Arbitrations, Hearing Volume No. 33, May 1, 1998, pp. 58-59 (excerpt included as Attachment 25).

4. Limits To Physically Separating IDLC Loops

107. Because the IDLC terminates directly into the switch without any physical loop termination on an MDF, the concept of an IDLC loop is fundamentally incompatible with BellSouth's proposal to require CLECs to connect the loop and switch through collocation. IDLC loops cannot be manually disconnected from the switch on a customer-by-customer basis in the way copper loops can be. As a result, to break apart an IDLC loop from switching, as BellSouth believes must occur under its collocation requirement, ILECs must resort to methods that are rarely available, impractical, and typically involve significant degradation of the customer's service.

108. The first method for serving an IDLC loop through BellSouth's collocation requirement is to disconnect the copper loop distribution (e.g., at the IDLC remote terminal) and then reconnect the loop onto a spare analog loop pair. This solution is possible only where a spare analog loop that meets technical requirements can be found in the vicinity of the customer. No such spare loop likely would exist in a new development that was provisioned with IDLC from the outset. In older areas, there may be spare copper loops that an ILEC has replaced with IDLC. However, the very fact that the loops were abandoned for an upgrade to IDLC technology means that they may be poor quality. Thus, a CLEC customer that is moved off of a state-of-the-art IDLC loop onto the old analog loop plant may immediately experience a degradation of service quality. To a CLEC struggling to establish consumer confidence, the consequences of imposing such degraded service (or even the risk of such degradation) on its new customers are very serious.

Furthermore, this method could impose additional costs and delay if the ILEC's switch did not have sufficient analog line cards to support conversion of these formerly digital loops to analog loops.

109. A second possible method to provide CLECs with access to customers served by IDLC loops is to move the customer's line to a parallel universal digital loop carrier system (UDLC), or to convert the entire IDLC system to a UDLC system. The UDLC is an older version of digital loop carrier equipment that multiplexes copper loops at a remote location, but then demultiplexes and converts the loops back to an analog service in the central office, thereby allowing an individual customer's line to be accessed at the MDF. Then, the circuit is re-converted to a digital signal, to allow it to interface with a digital switch. These multiple conversions between digital and analog signals, however, may degrade the quality of service for the customers involved. Each time the signal is converted from analog to digital, additional loss is added to the circuit, resulting in an inferior quality of service. Furthermore, converting the entire IDLC system to a UDLC system, while technically possible, makes no sense from an economic or technical perspective, because ILEC customers would likewise be affected and subject to the same quality concerns.

110. In sum, the lack of any readily available, economical, reliable, and competitively equivalent means for physically separating IDLC loops makes BellSouth's insistence on collocation unworkable and anticompetitive. It effectively enables BellSouth to seal off from competition that portion of its customers that it chooses to serve via IDLC loops.

111. As explained in Part IV below, IDLC loops can be electronically separated from, and then combined with, the ILEC's switching element using the recent change process. Given the inherently discriminatory nature of combining IDLC loops and switching via collocation, access to this electronic means of combining these elements will be essential if CLECs are to be able to compete for customers served by IDLC loops.

5. Limits To Collocating at Remote Switching Locations

112. The problems of combining the loop and switch port through collocation are heightened by BellSouth's extensive use of remote switch modules. When a remote switch module is employed, the local loop does not terminate at the MDF in the central office. Instead, it terminates at a frame within the remote site, which is located a significant distance from the central office that houses the host switch. The remote switch module and associated support equipment are typically housed in small, unstaffed spaces. Consequently, collocating equipment for the purpose of recombining loops with switches poses a severe logistical problem due to the lack of space. In Louisiana, BellSouth has 117 active remote switch modules. Assuming that each is designed to serve 2,000 customers and is operating only at 50 percent capacity, BellSouth's collocation requirement would potentially insulate over 100,000 customers from competition.

C. <u>Collocation Results in Inferior and Degraded Service for Consumers</u>

113. BellSouth's collocation requirement will lead to inherently inferior service quality for CLECs who recombine the unbundled loop and switching elements. The wire used on the MDF typically is only 22 gauge, which means that the wires themselves are

approximately the diameter of pencil lead. Such thin wires are inherently frail, and tend to break if subjected to extensive pulling and tugging. Moreover, many of the wires connecting loops and switching have been in place for many years. A collocation requirement entails unnecessary handling and removing of these wires as customers change local service providers. As significant competition develops and customers begin to churn, the continual activity and increased congestion on the frame caused by installing new cross-connects and removing the old cross-connects will put an unnecessary stress on the frame's jumpers, at times causing a connection to break inadvertently. See Attachment 1 (Joel Aff., Attachment 4 (showing congested frame from 1970s)).

114. BellSouth claims that I overstate the risks of outages caused by the breaking of the thin cross-connect wire, and that "no such problem exists. This is true even though 'pulling and tugging' to mine old cables . . . has gone on for years without serious incident. Similar movement of cables to serve CLEC customers involved no more stress on the network that [sic] this long-standing practice in BellSouth's retail operations." Milner Aff. ¶ 48. Where Mr. Milner goes wrong is in describing the use of cross-connects to recombine UNEs as "similar" to the "long-standing practice" that has "gone on for years" in the central office. The long-standing practice (i.e., before BellSouth's collocation requirement) was to maintain dedicated inside plant, and to limit, as much as possible, manual disconnection and reconnection and the associated pulling and tugging of cross-connects. See Joel Aff. ¶¶ 22, 28-33, 36-41, 46-54 (Attachment 1); see also infra ¶ 183 (describing testimony of Bell Atlantic witness that his company's "goal is to maintain

dedicated outside and inside plant"). Because that practice makes sense, I am not surprised that BellSouth believes there is currently "no such problem" with outages caused by broken cross-connects -- though I know from personal experience that outages can and do occur (in fact, I have inadvertently caused some myself). BellSouth's collocation requirement, on the other hand, flies in the face of that current practice, and will involve an unprecedented amount of pulling and tugging on the cross-connects. With this significant increase in activity at the frame, I am certain that the risk and incidence of breakage will also increase.

115. In an earlier, and more forthright, paragraph, BellSouth admits that in performing this manual frame work, there is "a risk of human error causing delays or errors." Milner Aff. ¶ 47. BellSouth, however, contends that CLECs need not be concerned with such errors because there will not be a "more substantial risk to a CLEC's customers than . . . to BellSouth's." However, this is false, for several reasons.

116. In fact, the impact of the increased strain on the frame and resultant service failures will be borne disproportionately by CLECs. First, recombination by collocation will double the number of cross-connections on the MDF frame for CLEC loops compared to ILEC loops. See Figure 6 (Attachment 21). Jumpers in a frame (especially the MDF) will be subjected to significant pulling and tugging as technicians move other jumpers across or around the frame, or "mine" out old wires that are no longer being used. See Attachments 7 & 8 . As this activity increases with competitive activity, so too will CLEC (and ILEC) service failures.

117. Further, a typical loop connection for a BellSouth customer in a wire center has only two points of connection to a frame -- one on the terminal connecting to the loop, and the other on the terminal attached to the switch port. These points of connection are "points of failure," because they are places where the loop connection is most likely to fail due to human error. For example, if the technician fails to strip enough insulation from the wire, the wire will not wrap properly around the terminal and may come apart. Conversely, stripping too much insulation will expose bare wire that can touch an adjacent terminal and cause a short. Under BellSouth's collocation requirement, loops that are recombined with switching for a CLEC's customer will require an absolute minimum of four points of failure, and could require up to 8 or more such points depending on whether an IDF is used to reach a CLEC's collocation space. Thus, the collocation requirement at least doubles the possibility that CLEC loops will fail or will be subject to some human error during manual processes.

118. In addition, the potential for human errors that occur in a CLEC's customer installations will at least double. In addition to the "ordinary work" (associated with basic unbundled loop provisioning) of directing a loop to the correct pair of the tie cable corresponding to the CLEC's collocation equipment, technicians must also connect the CLEC's pair of the return tie cable to the correct terminals on the MDF block that corresponds to the correct switch port. Thus, technicians will have to perform twice the amount of work for CLEC customers served by the loop/switch combination. For all these

reasons, under a collocation requirement, the risks of service problems for a CLEC customer are far greater than those for an ILEC customer.

119. Moreover, once a service problem develops, a diagnosis can be made more quickly for an ILEC customer than for CLEC customer, if a collocation requirement is imposed. When there is trouble on a CLEC's customer's circuit, CLECs and ILECs will have to coordinate efforts to determine whether the source of failure is in the collocated space, the ILEC tie pairs, the jumpers, or the MDF. This process will become even more difficult over time, as inevitable errors in recombination work cause incorrect disconnections and incorrect pairings of loops and switch ports. In contrast, when there is trouble on an ILEC customer's line, no such complicated coordinated effort is required. Notably, when an ILEC wins a customer back from a CLEC, it need not replicate the daisy chain. Instead, it only needs to re-establish a single cross-connect at the MDF. Even at this stage, collocation disproportionately disadvantages CLECs.

120. Finally, a CLEC can expect additional service problems under a collocation requirement because additional loop length is often added that may degrade the quality of service and require changes in the ILEC's records to reflect the changed characteristics of the loop. If the ILEC does not make these changes, maintenance and repair functions cannot be properly performed. For example, changing the length of loops could have an impact on mechanized loop test (MLT) results, because when the make-up of a loop is changed (e.g., a change in loop length), the test could give improper results. Thus, the ILEC must reflect the change in its records to ensure that MLT results will be accurate.